

## Operating instructions

Machine designation: Special model-cutting saw

Machine type: S-G 350

Machine no.: .....

*Keep for future reference!*

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## Dear customer,

Thank you for the confidence you have placed in us by purchasing this special model-cutting saw.

Please take time to read these operating instructions carefully, especially before using the unit for the first time, as this will ensure that the unit will give you good service for many years to come.

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# 1 Safety

## 1.1 Correct use

The S-G 350 special model-cutting saw is used in dental laboratories for producing high precision saw cuts when cutting segments (stumps) out of models of different plaster-like materials.

Dust generated during sawing should be extracted by a dust extraction installation specifically designed for this type of unit.

Unauthorized modifications and additions are not permitted for safety reasons!

The operating and maintenance conditions specified in these operating instructions must be adhered to.

<b>Caution</b>	The unit is not designed as a <b>medical</b> device! Use on people is prohibited!
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## 1.2 Possible dangers

- The special model-cutting saw is safe if used correctly, but a risk of injury does exist if it is operated or handled incorrectly.
- The bottom side of the model should be ground flat and even. Its circumference should be roughly adapted to the right angle of the clamping claws so that it can be securely fastened between them on the model holder plate. Ensure that the model is fastened evenly between the three claws when clamping. Never fasten it between two claws only! The model can be thrown out of the model holder if not sufficiently fastened, and the saw blade destroyed as a result.
- The tool should only be operated with the saw blade guard mounted and the safety screen screwed in position. The course of the saw blade (when sawing) should only be watched through the safety screen, as projected parts could lead to injuries.
- Maintain a sufficient safety distance from the saw blade.
- Insert the rotating saw blade slowly and with moderate pressure into the model. The saw should not be switched off while the blade is still in the saw notch. Never insert the saw blade into a saw notch while the blade is stationary. This will prevent the saw blade from jamming.
- Switch off the unit and disconnect from the mains power supply before carrying out maintenance and cleaning work.
- The unit should be disconnected from the mains power supply before accessing the built-in electrical components!

<b>Danger</b>	The unit is not suitable for use in rooms where special conditions exist (e.g. corrosive or potentially explosive atmospheres).
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### 1.3 Approved operators

The operator of the unit should ensure that the operating instructions are accessible to the operating personnel and have been read and fully understood. Only then should the operator commission the unit.

### 1.4 Safety measures at site of operation

- The installation surface should be flat and stable enough to support the weight of the special model-cutting saw.
- Ensure that the workplace always complies with pertinent accident prevention regulations by introducing appropriate internal company instructions and conducting inspections.

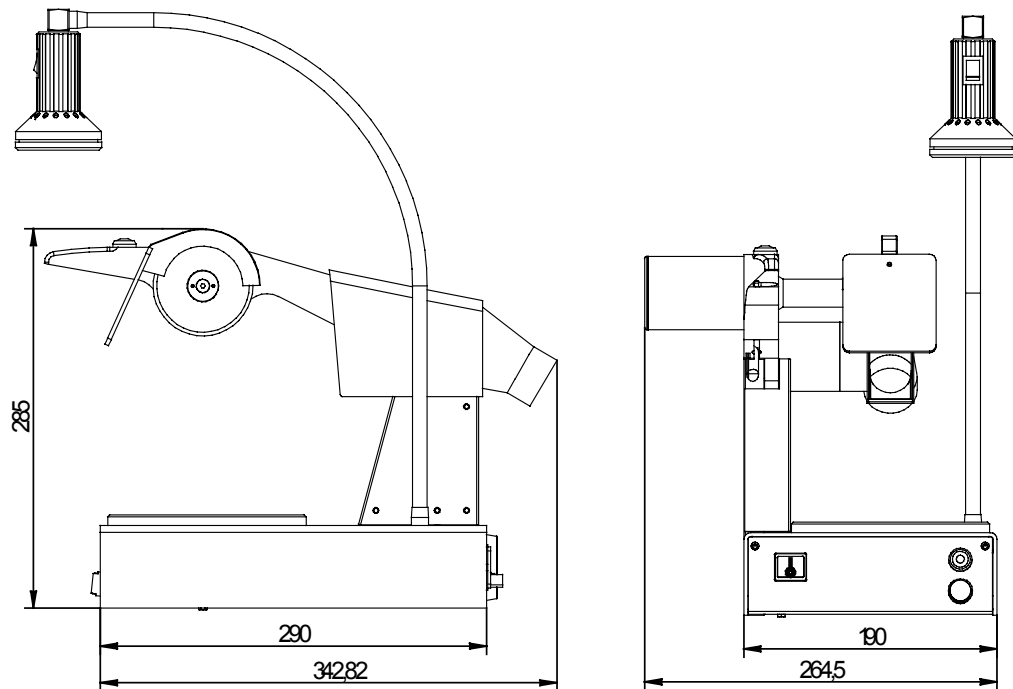
### 1.5 Marking of safety references contained in these instructions

Note	Refers to tips and other particularly helpful information.
Caution	Refers to particular methods of operation or handling, non-adherence to which can lead to malfunctioning, damage or other problems.
Danger	Refers to dangerous situations which can lead to injuries.

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## 2 Starting up

### 2.1 Technical data



Illus. 1: Technical data

Machine designation	:	Special model-cutting saw
Machine type	:	S-G 350
Unit dimensions	:	Width 265 mm Depth 345 mm, Height 285 mm (without illumination)
Electrical connection	:	230 Volt/50 Hz
Overvoltage category	:	II
Power consumption	:	max. 250 Watt
Noise level	:	60 dB(A)
Electrical fusing	:	2x 10 A/T (mains connection) 1x 1.6 A/T (primary winding - transformer) 1x 10 A/T (secondary winding - transformer) 1x 2 A/T (illumination)
Speed	:	7500 rpm
Sawing thickness (saw blade)	:	0.3 mm
Sawing depth	:	approx. 25 mm
Saw blade	:	75 mm (outer diameter), diamond blade
Suction nozzle	:	40 mm (outer diameter)
Stroke	:	75 mm
Weight	:	approx. 12 kg

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## 2.2 Unpacking the special model-cutting saw

1. Place the carton on a flat surface.
2. Remove the top packaging material.
3. Push the packaging material away from the unit. Grasp hold of the unit by the lower edge.

**Caution** Do not lift the saw by the motor out of the carton!

4. The unit (weight = approx. 12 kg) should be lifted out of the carton by two persons.
5. Check the accessories:
  - Documentation
  - Mains power cable .....Art. no. 35028
  - Saw blade guard .....Art. no. 36208
  - Perspex safety screen .....Art. no. 70030
  - Model table .....Art. no. 15041
  - Cleaning stone with 2 wooden supports .....Art. no. 15012
  - Diamond blade.....Art. no. 85001
  - Offset screwdriver (2 mm) for Allen socket screws .....Art. no. 93001
  - Offset screwdriver (3 mm) for Allen socket screws .....Art. no. 93002
  - Straight pin (diameter 4 mm) .....Art. no. 81167
  - See delivery note for further possible accessories

## 2.3 Short description of unit and identification of components

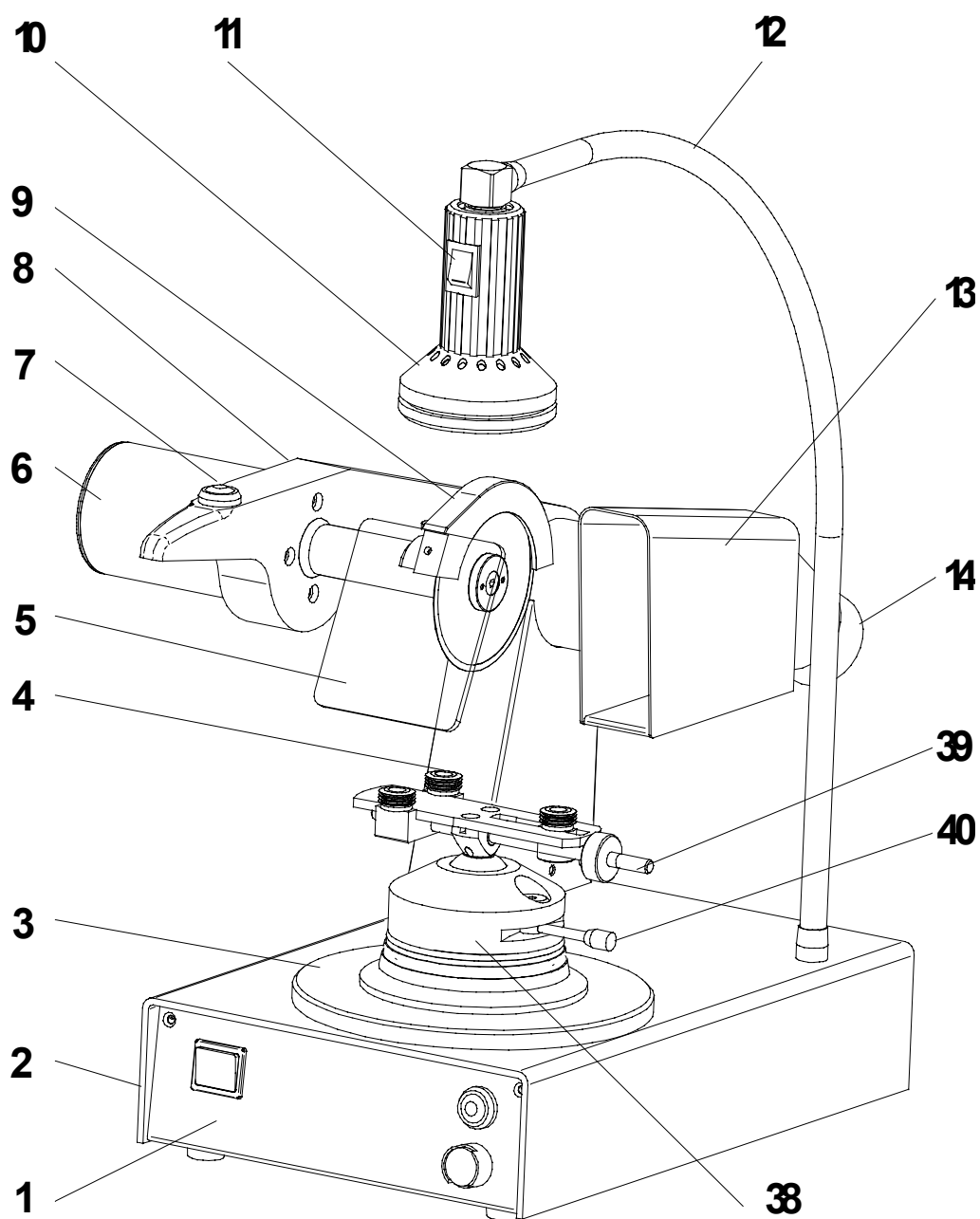
The special model-cutting-saw consists of a base frame with an affixed magnetic plate. The electronics are integrated in the base frame. A powerful flange motor is attached to the saw lever which directly drives the saw blade. It can be easily moved vertically on a ball-bearing joint.

The model table is fastened to the magnetic plate by energizing the magnet.

The suction connection fitting (with a diameter of 40 mm) is located at the rear of the unit, together with a socket for the necessary extraction unit. A suction funnel travels along the entire length of the stroke, ensuring clean, dust-free working conditions.

A rapid-action stop device quickly brings the flange motor with the saw blade to a standstill.

The hand lever lowers the saw blade vertically onto the model.



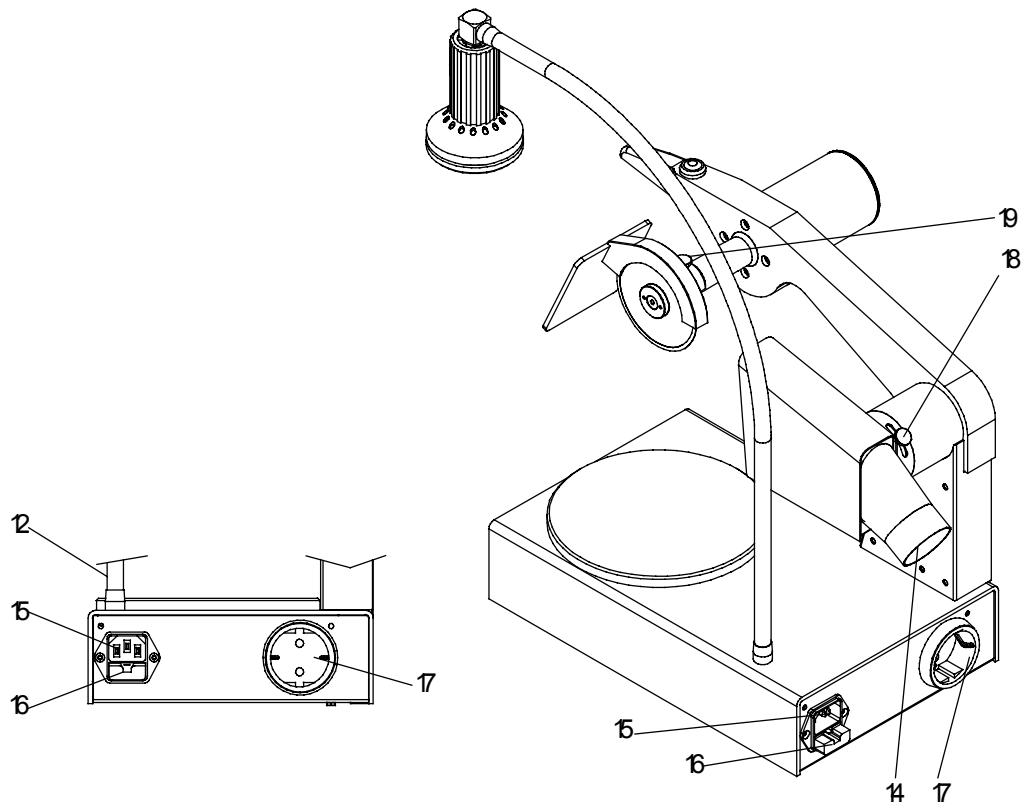
Illus. 2: View from front right

1	Plate	10	Halogen lamp
2	Base frame	11	Switch for illumination
3	Magnetic plate	12	Lamp bracket
4	Diamond blade	13	Suction funnel
5	Perspex safety screen	14	Suction fitting
6	Motor	38	Model table
7	Multifunction switch	39	Knurled nut (for clamping)
8	Saw lever	40	Clamping lever
9	Saw blade guard		

## 2.4 Starting up procedure

(see Illus. 2, Page 6 and Illus. 3, Page 7)

1. Remove transportation protection by loosening the Philips screw in the base plate. Insert the shorter screw attached to the transportation protection again. Keep transportation protection for later use.
2. Insert the diamond blade (see Section "3.2 Inserting the diamond blade").
3. Connect the activated extraction unit to the socket (17).
4. Establish connection to the mains supply (230 volts/50 Hz) with the mains connection cable.
5. Connect the suction hose (diameter 40 mm) to the connection fitting (14).
6. See Section "3.3 Explanation of electrical function" for further details on electrical function.
7. See Section "3.4 Sawing procedure" for further details on sawing procedure.



Illus. 3: View from rear

14	Extraction connection fitting Ø 40 mm	16	Main fuse 2x 10 A/T
15	Mains connection socket (230 V / 50 Hz)	17	Socket for extraction unit



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## 3 Operation

### 3.1 Removing the diamond blade

(see Illus. 2, Page 6 and Illus. 4, Page 9)

1. Insert the straight pin (32) in the cross hole (31) and loosen the screw (36) with the offset hexagonal Allen key (3 mm) by turning counterclockwise, countering by holding the straight pin (32).
2. Remove the Allen screw (36), pressure disk (35), plastic disk (34), diamond blade (4) and steel disk (32).

<b>Note</b>	The diamond blade (44) is not fitted ex works.
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### 3.2 Inserting the diamond blade

(see Illus. 2, Page 6 and Illus. 4, Page 9)

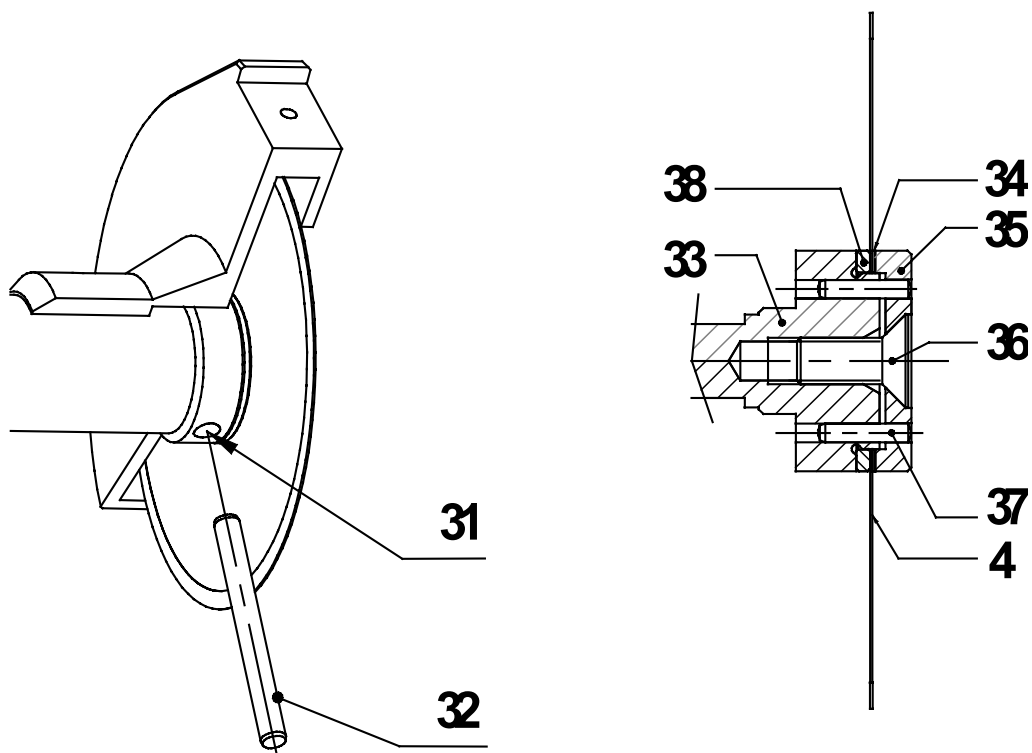
<b>Note</b>	Always ensure that the support surfaces of all parts concerned are free of dirt when inserting the saw blade.
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1. Insert the steel disk (32).
2. Insert the diamond blade (4).
3. Insert the plastic disk (34).
4. Push the pressure disk (35) onto the driver pins (37).
5. Insert the straight pin (32) in the cross hole (31) and tighten the screw (36) lightly with the offset hexagonal Allen key (3 mm), countering by holding the straight pin. It should just be still possible to turn the diamond blade when the spindle is jammed. Continue turning the diamond blade a few times. This will eliminate any possibly unevenness and achieve an optimum degree of concentricity (true running).
6. Tighten the screw (36) firmly by turning clockwise, countering by holding the straight pin (32).

<b>Danger</b>	The straight pin (32) may only be inserted into the cross hole (31) when changing saw blades. It must be removed immediately when the blade is replaced.
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7. Screw the saw blade guard (9) with the perspex safety screen on, using the knurled screw (19).

<b>Note</b>	The diamond blade is not fitted ex works..
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Illus. 4: Inserting the diamond blade

4	Diamond blade	35	Pressure disk
31	Cross hole	36	Hexagonal socket screw (3 mm)
32	Straight pin (diameter 4 mm)	37	2x driver pins (marked offset)
33	Shaft	38	Steel disk (hardened, 1.5 mm thick)
34	Plastic disk (0.3 mm thick)		

### 3.3 Explanation of electrical function

(see Illus. 2, Page 6)



Illus. 5: Plate

22	Main switch	24	Start button (two-hand safety circuit)
23	Magnet button		

- Turn the main switch (22) to "On".
- The magnet (3) is actuated and the extraction unit starts if the magnet push button (23) is pressed (green light illuminates).
- The motor only runs if the button (7) and start button (24) are pressed simultaneously (two-hand safety circuit).
- Press the push button (23) again to break the magnet power supply. The green light is also extinguished as a result.

### 3.4 Sawing procedure

(see Illus. 2, Page 6)

1. Turn main switch (22) to "On".
2. The magnet push button (23) should be off (green light off).
3. Place the model table (380) on the magnetic plate (3). The model should be ground so that it is completely within the clamping claws and lies level on the model support plate. Fasten the model securely with the knurled nut (39).
4. Open the clamping lever (40).
5. Lower the saw lever (8) until the saw blade is just above the model.
6. Establish the sawing position of the model.
7. Press the magnet push button (23). The green lamp illuminates. The model table base is securely fixed. The extraction unit is activated.
8. Tighten the clamping lever (40) firmly. The model is now securely fixed.
9. Position the suction fitting (13) correctly with the aid of the knurled screw (18).
10. Press the multifunction switch (7) and start button (24) (two-hand safety circuit). The saw blade begins to rotate!

<b>Caution</b>	Do not lower to saw into the model until the speed of the saw blade is sufficiently high. Proceed by lowering the saw lever (8) gradually.
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<b>Danger</b>	<p>Clogging of the grit heats up the diamond blade while sawing. This in turn leads to an expansion of the blade edge, thus causing the blade to flutter. Fluttering is a permanent twisting of the blade edge which can cause material fatigue and eventually breakage.</p> <p>The same effect can be seen when too much pressure is exerted on the saw blade while sawing very hard materials. It is very important in such a case to lift the diamond blade several times out of the sawing notch so that it can cool down occasionally.</p>
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## 4 Cleaning/Maintenance

### 4.1 Cleaning the diamond blade

The grit of the diamond blade can be cleaned of plaster clogging after lengthy periods of use by proceeding as follows:

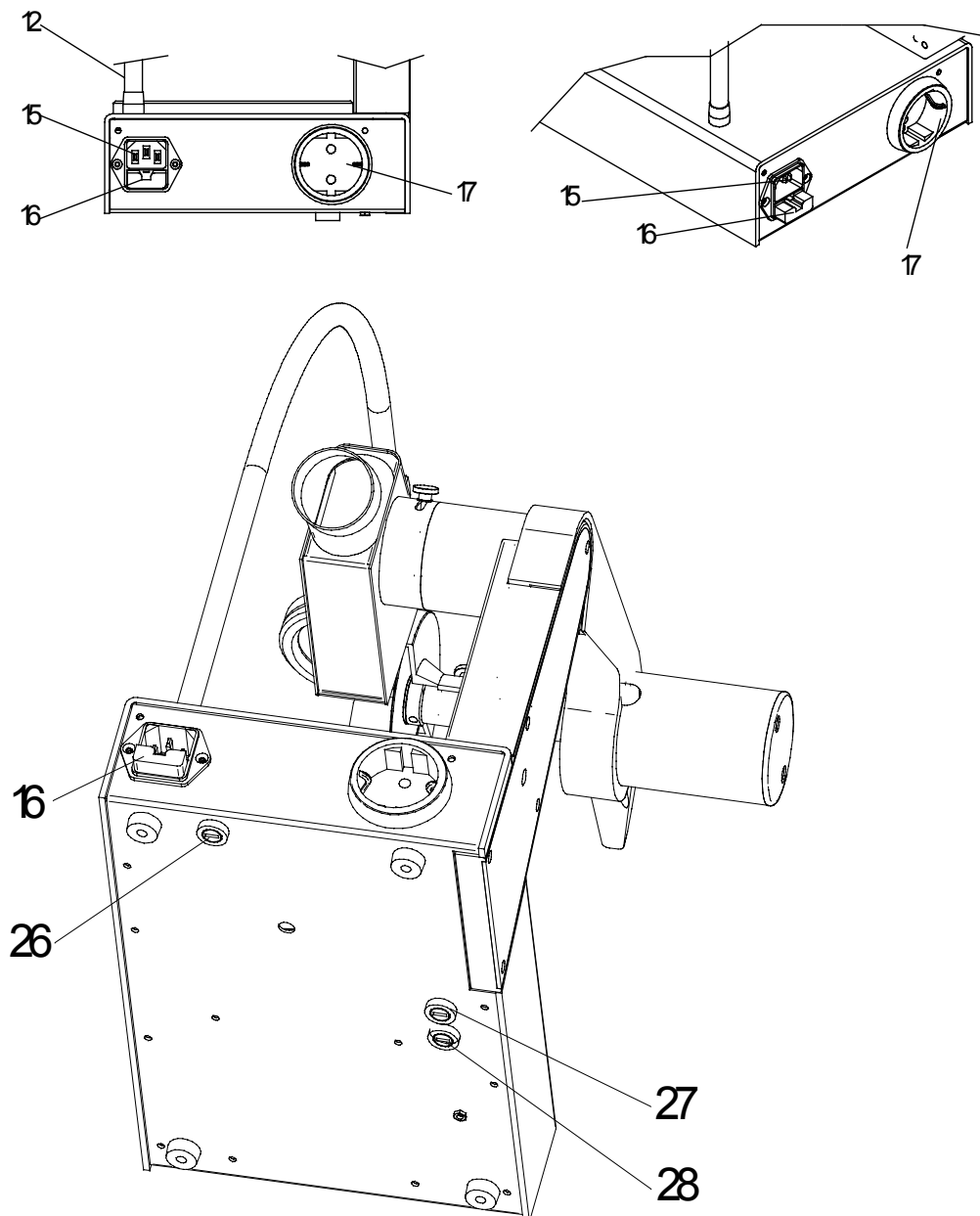
1. Immerse the cleaning stone provided (100x24x12 mm) until it is saturated with water.
2. Clamp the cleaning stone between the wooden supports (45x12x12 mm) in the model table so that a thin slice can be cut off.

<b>Note</b>	Cutting through the wet cleaning stone cleans the diamond grit.
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## 5 Electrical fuse protection

(see Illus. 6, Page 11)

- The mains connection (15) is protected by two main fuses (16) 2x 10 A/T.
- The secondary winding (transformer) is protected by a fine fuse (28) 10 A/T.
- The primary winding (transformer) is protected by a fine fuse (27) 1.6 A/T in the base plate.



Illus. 6: Electrical fuse protection

12	Lamp bracket	17	Socket for extraction unit
14	Extraction connection fitting Ø 40 mm	26	Fine fuse for illumination (1x 2 A/T)
15	Mains connection socket (230 V / 50 Hz)	27	For primary winding (1x 1.6 A/T)
16	Main fuse (2x 10 A/T)	28	Fine fuse for secondary winding (1x 10 A/T)

## 6 Warranty conditions

This device conforms with current safety regulations and was subjected to extensive testing before leaving the works.

We grant a 12 months guarantee in which we are obliged to carry out all repairs necessary as a result of material or production faults free of charge.

### Warranty limitations:

1. The guarantee is considered void if repairs are not carried out by specialized dealers or by us.
2. Spare parts deliveries made for reasons covered by the guarantee do not lead to an extension of the original guaranty period.
3. Incorrect installation (e.g. failure to heed VDE\* regulations or written installation instructions).
4. Incorrect operation or stress.
5. External influences (e.g. transportation damage, damage caused by impacting or blows, damage caused by the effects of weather or other natural phenomenae).
6. Repairs and alterations not carried out by authorized third parties.
7. Unit breakdown resulting from adjustment, alteration or any other attempt to adapt the unit is not considered a material or production fault. **This guarantee neither encompasses the costs of such adjustment, alteration or any other attempt to adapt the unit, nor remedying of the resulting damage.**
8. Normal wear and tear (e.g. spray nozzles, hoses, and including hand-held pieces, union nuts, glass panes, carbon brushes, illumination agents) or damage resulting from incorrect operation is not covered by the terms of guarantee.

In order to provide you with a comprehensive service we would like you to fill out the guarantee return form (enclosed at the beginning of these instructions) and send it to us by fax or letter (window envelope).

\* Verband Deutscher Elektrotechniker (German Electrical Technician Association)

Fax no.: 0 71 81/ 73 13 9

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**Duplicate**  
Guarantee return form

**Harnisch+Rieth GmbH & Co.**  
**Maschinenbau**  
**Postfach 1260**  
**73644 Winterbach**

Machine designation:	Special model-cutting saw
Maschine type:	S-G 350
Maschine no.:	
Date of purchase:	
Dealer/Store:	
From:	
Date/signature:	

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## 7 EC declaration of conformity

### as stipulated by the EC directive for machines 98/37/EC

We hereby declare that the design of the machine specified below conforms with basic safety and health requirements of the listed EC directives.

This certificate is no longer valid in the event of modifications being made to the machine which are not approved by us.

Name of the manufacturer	: Harnisch+Rieth
Address of the manufacturer	: Küferstraße 14-16, 73650 Winterbach
Machine designation	: Special model-cutting saw
Machine type	: S-G 350

The following pertinent EC directives were applied:

EC machine directive (98/37/EC)

EC low voltage directive (73/23/EEC), equivalent to 1. GSG regulation of 11.06.79

EC EMC directive (89/336/EEC), equivalent to EMC law of 09.11.92

The following harmonizing standards were applied:

DIN EN 292 : Machine safety.

DIN EN 61 010-1 : Safety regulations for electrical measurement, control and laboratory devices.

DIN EN 55 014 : Interference suppression of electrical devices and systems.

DIN EN 55 104 : Electromagnetic compatibility, noise resistance requirements (category I).

Technical documentation is available.

The operation instructions relating to the machine are also available.

Director of the Quality Control Department

Winterbach, 1st July 2003